PROCEEDINGS OF TDWG

Biodiversity Information Science and Standards 1: e19932
doi: 10.3897/tdwgproceedings.1.19932

OPEN ACCESS

Conference Abstract

The Value of Agricultural Voucher Specimens

Mary Barkworth[‡], Paul G. Wolf[‡], Sylvia Kinosian[‡], Curtis Dyreson[‡], Will Pearse[‡], Ben Brandt[§], Neil Cobb[§]

‡ Utah State University, Logan, United States of America
§ Northern Arizona University, Flagstaff, United States of America

Corresponding author: Mary Barkworth (mary.barkworth@usu.edu)

Received: 31 Jul 2017 | Published: 01 Aug 2017

Citation: Barkworth M, Wolf P, Kinosian S, Dyreson C, Pearse W, Brandt B, Cobb N (2017) The Value of Agricultural Voucher Specimens. Proceedings of TDWG 1: e19932.
https://doi.org/10.3897/tdwgproceedings.1.19932

Abstract

Voucher specimens are the ultimate raw data of biodiversity studies because they document the interpretation of the names used in papers and reports resulting from such studies. The value of voucher specimens is increased by making their records web-accessible but they can be further enhanced by linking them to other online resources, particularly if the links are birectional. In this presentation, we discuss the potential benefits of such links for a group of agricultural significance, the *Triticeae*, a tribe of grasses that includes wheat, barley and rye among its 300+ species. The late Dr. D.R. Dewey conducted extensive cytogenetic studies in the tribe and deposited voucher specimens in the herbarium of Utah State University. Some of the voucher specimens were collected in the region but the majority were grown from germplasm accessions obtained from GRIN, the United States Department of Agriculture's Germplasm Resources Information Network. The specimen labels of the GRIN vouchers hold minimal information but one item that is present is the “PI Number” or GRIN identifier. Linking the GRIN vouchers to data in the GRIN database gives access to the original collection information, which is often complete enough to permit georeferencing the specimen, thereby enabling it and any derived information to be associated with the environmental parameters at the point of collection. The links could also be used to disseminate changes in identification of the voucher specimen to genebanks with duplicates of the original accession. The PI numbers also link the specimens to trait data deposited in the world’s genebank system and to publications in which the accession was cited, regardless of whether they relate to the original intent of the

© Barkworth M et al. This is an open access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

seed collectors. The impediment is that few collection databases are designed for effective capture of genebank identifiers. Another problem, from a taxonomic perspective, is that such stored trait information is of agricultural but not taxonomic value. Thus, one challenge is to modify specimen database systems so that they can effectively store taxonomically useful data; the other is to persuade those working on a taxonomic group to identify, score, and share data about core taxonomically useful characters for the group. Such "databases" currently exist, if at all, as a spreadsheet on an individual's computer and may represent hours of labor measuring multiple features of individual specimens. Another potential linkage for many herbarium specimens is the Index of Plant Chromosome Numbers (IPCN). Again, one problem is providing easy access to the linking fields in both IPCN and the collection database; another is the lack of funding for maintaining IPCN. Linking specimens to sequence data is, by comparison, relatively simple but it would be useful for herbarium and genebank managers to know when the specimens/accessions they curate or have duplicates of have been used in a molecular study. Moreover, GenBank needs to have a mechanism for reporting that the identification of a voucher specimen has been changed. Our interest in these questions arises from a decision by The International Triticeae Consortium, a group that shares a common interest in members of the *Triticeae*, to pursue development of a web site that would provide access to data about the tribe's members. Because of the economic importance of wheat, barley, and rye, the tribe is studied in almost every country. It is also the subject of significant taxonomic disagreement, an aspect that can present an impediment to those working with its members. Although the presentation will focus on the *Triticeae*, the approach and principles involved would apply to any taxonomic group.

Keywords

Collection databases, voucher specimens, GRIN, Triticeae, chromosome numbers, morphology

Presenting author

Mary Barkworth